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THE TWO ENDS OF STRAW

Among the more elementary things that appear to have received less than their fair share of attention from agricultural scientists is the fact that straw has two ends. This observation has been made before, but it would seem that only practical persons, such as thatchers, straw-plaiters, and makers of covers for wine bottles, have exploited the obvious. During the century that agricultural science has been active, hundreds of analysts in dozens of experiment stations have been giving attention to all sorts of things, and it might be thought that a complete record of at least the elementary composition of common agricultural substances would be available by now. The situation is otherwise, as those know who engage in the painful search for data, often nonexistent, and always uncoördinated if available.

In the case of straw, a hundred years of analysis have brought forth, so far as the author can find, only four sets of data, contributed by three workers, which recognize that straw has two ends. The first person to show that the two ends of straw do not have the same chemical composition was Professor James F. W. Johnston. His results are outlined in his stimulating book, *Elements of Agricultural Chemistry and Geology* (Edinburgh, 1842), which enjoyed great favor during the middle of the last century, and deservedly ran into many editions. The sixth edition, published in 1852, was the earliest accessible to the author. Even in the light of present knowledge, Johnston's book is remarkable for its soundness, wisdom, and breadth of view, and it is pleasant to note that his works had a profound influence on the agricultural science of their period.

Johnston's differential analyses of the several parts of straw were quoted by John Pitkin Norton of Farmington, Connecticut, in his original paper, "On the Analysis of the Oat." This extensive essay, bearing the date October 1845, received the premium of fifty sovereigns in gold, given by the Highland and Agri-

cultural Society of Scotland in 1846.[1] It was written from the laboratory of the Agricultural Chemistry Association of Scotland, of which Johnston was the principal chemist.

A paper on the "Chemical Investigation of the Potato" by P. F. H. Fromberg, first assistant in the laboratory of the Agricultural Chemistry Association, also gained a premium of fifty sovereigns, but, unlike Norton's paper, it was not dated from a laboratory. Fromberg distinguished three parts of the potato tuber, though no distinction of the aboveground portion of the plant was made, except as stem and leaves. Some of his remarks are worth reproducing here:

> . . . it appears certain that the proportion of protein compounds varies in different parts of the potato [tuber], and it can scarcely fail to appear probable, that this is connected with the physiological nature and functions of these several parts, and the organisation of the whole tuber. If it be found, as I shall endeavour to establish by further investigations, that the rose end contains a greater quantity of protein compounds than the opposite extremity of the tuber- which seems to be generally richer in starch- then we should be almost induced to connect this with the more rapid and abundant sprouting of the eye or rose end, than that of the other extremity.

Norton and Fromberg worked in the same laboratory under Johnston, and it is not surprising that both had ideas respecting the polarity or "endedness"—to coin a word—of agricultural products. Beyond this, little can be said concerning the relationship between the American and the Dutchman.

The third and fourth sets of analyses of the two ends of straw were published by J. I[sidore] Pierre in 1863 and 1866. His first

[1] The paper was printed in the Society's *Transactions* (ser. 3), 2:321–356 (July 1845–March 1847), and in Benjamin Silliman's *American Journal of Science and Arts* (ser. 2), 3:222–236, 318–333 (May 1847).

It is difficult to ascertain the exact terms of the award because of the confusion in the pagination of the sections devoted to the list of premiums in the *Transactions*. In the 1846 and 1847 announcements of awards for analyses of the ashes of plants to be filed with the Society by Nov. 10, 1848, it was suggested that entrants turn their attention to such plants in common cultivation "as wheat, barley, turnips, or beans," and "the more abundant weeds."

For information, including bibliographical notes, on Norton, see R. W. Hill, "John Pitkin Norton's Visit to England, 1844," in *Agricultural History*, 8: 219–222 (October 1934).

results were reported in a pamphlet of 124 pages, a copy of which is preserved in the library of the Rothamsted Experimental Station as its *Library Pamphlets*, v. 13, no. 23. It is not known whether the copy is a reprint or a monograph.[2] Although some echo of Johnston's teaching regarding the rôle of silica may have reached him, Pierre seems to have been unaware of the work of Norton and Johnston on the "endedness" of straw. He claimed to have no other aim than verification of the conclusions of J. B. Boussingault which he believed to be well founded on work capable of being extended and completed.[3] Pierre began his observations on the composition of the wheat plant in 1848, but it was not until 1863 that he felt competent to undertake a thorough and periodical examination, the results of which are set forth in great detail in his paper of the same year.[4]

Pierre's work is more extensive than that of Norton and Johnston, and his first paper will be considered at some length. The wheat that he used was sown in November 1862. He took samples of the growing plant at six intervals from April 19 to July 30—the day fixed for harvesting the entire field. Each sample was an aggregate of three, taken from equal areas on each of three plot-locations believed to be representative of the

[2] Recherches expérimentales sur le développement du blé et sur la répartition, dans ses différentes parties, des éléments qui le constituent, à diverses époques de son développement Par M. J.-I. PIERRE. (Octobre 1863.) Caen.—Imprimerie E. Poisson.

From Pierre's monograph of 1866 (see footnote 5), it may be surmised that this publication is identical in content with his paper of the same title in the *Bulletin de la Société Linnéene de Normandie* (1863–64), 9:74–206 (Caen, 1865).

[3] Boussingault, "Recherches sur le développement successif de la matière végétale dans la culture du froment," in *Annales de Chimie et de Physique* (ser. 3), 17:162–171 (Paris, 1846). This article has not been examined by the author, but its content is probably identical with that of the section with the same title in his *Mémoires de Chimie Agricole et de Physiologie*, 197–206 (Paris, 1854). This research was undertaken to follow up remarks of Mathieu de Dombasle (1777–1843) of Roville, who, besides Boussingault, is the only author quoted by Pierre. Boussingault did not divide his straw.

[4] An apparently unsolvable discrepancy in date manifests itself in this connection. From various places in the 1863 paper it seems indubitable that it refers to work on the crop harvested in 1863, yet in the 1866 paper (see footnote 5) several references are made to work on the 1862 crop, but none to that of 1863.

field. The samples were freed from adherent earth, and were, as far as possible, divided as follows: 1, Roots, up to the crown (*collet*); 2, Dead leaves and atrophied stems, more or less dried up; 3, Leaves still green; 4, Lower part of stems, from the crown up to and including the last upper node; 5, Upper part of stems, from the last upper node to the base of the ear; 6, Entire ears. Sampling and analysis were performed with care and attention to every point: thus, the number of plants and tillers from each of the three plots was recorded separately. It was, however, only at the third sampling on June 13 that the first distinction between tops and bottoms of stems could be made, these being deprived of all leaves. The results were recorded for each part as: dry matter in samples, dry matter calculated per hectare, and the following constituents per kilogram: nitrogen (mean of two analyses), combustible or volatile matter (*less* nitrogen), and ash. The ash was analyzed for silica, iron oxide, phosphoric acid, lime, magnesia, potash, soda, and "difference." The same set of analyses was made throughout the experiment, not only on the stem, but on all parts of the plant. The figures for the "whole plant" were obtained by addition. Each set of results for samplings 2–6 were recorded in two tables, one giving composition per kilogram, the other, per hectare.

A conspectus of the results is presented in fourteen additional tables, expressed in the same two ways for each of the six parts of the plant, as far as available, and of the whole plant, for every sampling. A final set of seven tables presents the mean increase per twenty-four hours (an idea probably derived from Boussingault) of the total weight of a hectare, of the total weight of the crop, and of each of the constituents determined analytically for organic matter, combined nitrogen, P_2O_5, alkalies, silica, and $C_aO + M_gO$. Following these comprehensive tables, the results were also recorded in sixteen graphs.

The following selected data on the variations in the composition of wheat stems for one kilogram of dry matter with the weight expressed in grams, from pages 74 and 76 of Pierre's paper of 1863, are of interest.

	Lower Part					*Upper Part*			
Sample number.....	*2*	*3*	*4*	*5*	*6*	*3*	*4*	*5*	*6*
Combined nitrogen.....	12.54	7.21	4.29	3.02	1.73	21.18	18.86	9.09	4.52
Silica.....	9.53	10.06	11.81	12.91	16.63	13.76	22.37	17.17	30.03
Phosphoric acid.	3.80	2.88	1.57	1.06	0.40	5.13	5.39	1.56	2.19
Lime.....	4.04	3.76	1.96	1.94	1.60	6.38	3.69	2.35	4.63
Potash.....	14.46	6.06	6.90	4.59	5.85	12.52	8.71	4.89	2.78

In 1866 appeared a still more extensive report by Pierre, based on an analysis of wheat grown in 1864.[5] The plan of this work was basically similar to that reported earlier, but the plant was divided into as many as sixteen parts; the ear, and every leaf, node, and internode were analyzed separately, as well as the abortive and dried-up tillers, the chaff (*balles* or glumes), and the rachis of the ripe ears. The same chemical determinations as before were made on each part, and the results were likewise presented per kilogram and per hectare,—an arrangement which cannot be too highly praised. Each of the determinations was performed five times from May 11 until the day of harvest on July 25. An idea of the amount of data amassed may be gathered from the fact that pages 153–220 of the treatise are solely devoted to graphs, one to a page.

The results do not differ much in substance from those published in 1863, and it therefore seems unnecessary to do more than call the attention of plant physiologists to the wealth of material recorded by Pierre in this careful study. The monograph has, however, been the source of a few otherwise inaccessible references incorporated in the present paper.

Since Norton, the pupil, quoted Johnston, the master, their work may be considered together. To Johnston belongs the credit due a pioneer, though Pierre's work cannot be called

[5] *Recherches expérimentales sur le développement du blé et sur la répartition, dans ses différentes parties, des éléments qui le constituent à diverses époques de sa végétation* par J.-ISIDORE PIERRE, Membre correspondant de l'Institut, Professeur à la Faculté des Sciences de Caen, Président de la Société Linnéenne de Normandie, etc. Avec 68 Planches. Paris, Ch. Delagrave et C^ie^. Libraires-Editeurs, 1866 [ii, 220 p.] Extrait du XV^e^ volume des Mémoires de la Société Linnéenne de Normandie [(1865–69) 15:1–220 (Caen, Chez F. Le Blanc-Hardel . . . ; Paris, Chez Savy, Libraire de la Société Géologique de France)].

derivative. Norton's work was in some ways more extensive than that of Pierre, but less valuable in other ways. Norton made more frequent samplings than Pierre, and examined oats of more than one variety and from more than one type of soil. Pierre, however, determined more constituents than Norton. The latter's work, being less systematic than Pierre's, is not so easily summarized.

After giving numerous analyses of unripe oats, some of which were accredited to Fromberg, Norton, in a section entitled "Of the Ripe Plant," remarked:

> It has been shown by professor Johnston, that the ash from the straw of all the corn crops varies in quantity at different heights of the same stalk. To ascertain the nature and extent of this variation in the oat straw I considered a point of importance, and to it I first directed my attention. Each straw was divided into three equal parts, the bottom, the middle, and the top. See his *Elements*, p. 44.

Analysis confirmed Johnston's results that the amount of ash varied, not only in different specimens, but in different parts of the same plant. "There is not, however, a regular gradation in the quantity of ash, from the top downwards." After further discussion, Norton continued:

> . . . I come to an inquiry of much importance; do these differences in the quantity extend to the quality of the ash also? I shall proceed to show—1. That the ash varies in quality at different heights of the same stalk. Dividing the straw into three parts as above. . . .

A table was inserted, and from the results Norton directed attention to the following points:

> 1. To the great difference in the proportion of salts soluble in water . . . ; with the addition of the soluble silica, their amount [in the top straw] is 42 per cent, in the middle straw it is 55 per cent, in the bottom straw 77 per cent. . . .
> 2. To the abundance of sulphuric acid and the total absence of phosphoric acid in the watery solution.
> 3. That as the salts soluble in water increase from the top downwards, the silica increases from the bottom upwards. This seems to be an invariable law.

In the pursuance of these ideas, Norton made analyses of the three portions of ripe straw of the Hopeton variety of oats

grown on different soils. His table of results giving the composition of ash from straw of two specimens is worth reproducing:

	1, Top	*2, Top*	*1, Middle*	*2, Middle*	*1, Bottom*	*2, Bottom*
Salts soluble in water, chiefly sulphates and chlorides	41.96	71.70	55.22	84.03	77.46	90.26
Phosphates of lime, magnesia, and iron	2.94	0.77	3.03	1.51	0.78	2.21
Lime and magnesia	11.29	14.34	9.70	8.73	9.16	2.65
Silica	43.75	13.18	32.05	5.72	12.55	4.86
Total	99.94	99.99	100.00	99.99	99.95	99.98

In explanation, Norton said:

This table may be considered a very excellent illustration of the extent to which the soil modifies the composition of the ash. No. 1. is a fair example of a healthy straw. No. 2, being the same variety of oat, has been grown where its wants were not fully supplied. I have said that on the mossy [peaty] soil from which this sample came, the great difficulty was to make the straw stand. The above analysis shows that a want of silica was probably the cause of this difficulty. It is a curious fact in accordance with the above, that the addition of a very fine siliceous sand to some places on this soil has in a great degree remedied this weakness of straw.

Analyses from the top and bottom of the leaf showed that:

The differences of composition in these two ashes are of the same character as those which have been noticed in the straw. Though not so striking as those differences, they show that the same rule as to the preponderance of silica at the top, and of soluble salts at the bottom, holds true in both these parts of the plant.

In summarizing, Norton returned to the question of the rôle of silica in stiffening the parts of the plant, and probably he more than anyone else popularized the view that the stiffness of leaves and stems depends upon silica. The question, though interesting, does not primarily concern this paper, but a further quotation from Norton does, and may be of value today:

. . . I have, so far as my time permitted, turned my attention to the disease called the *Smut* in oats, and have several analyses of ash from the smutted straw. I regret much that they are not in a sufficiently advanced state for publication. So far as they go, they indicate a derangement in the circulation of the plant, especially in the top straw.

The work of Norton and of Fromberg on the composition of the different parts of oat straw was, in its turn, quoted by John-

ston in his *Elements of Agricultural Chemistry and Geology* and in the 1847 edition of his *Lectures in Agricultural Chemistry and Geology*. Norton stated that Johnston had given "some curious facts respecting the knots in the stalks of wheat, rye, bamboo, &c." in his *Elements*, but these observations were omitted in the 1852 edition. Although Norton determined the percentage of ash in the whole stalk of the oat, and in the knots only, at various stages of maturity, little emerges from his results.

Pierre, in his first report, attacked the problem of the composition of the knots in wheat straw, having "heard repeatedly that the nodes of the stalk of wheat are extremely rich in silica."[6] He was able to show that the nodes are the parts poorest in silica. He separated all the nodes or knots from 500 of the 847 stems sampled on July 30, and analyzed the bulk for the same constituents that he had sought in other sections of the plant. He found that the nodes contained only two-fifths of the amount of silica present in the lower part, and one-third of the amount contained in the upper part, the knots having been included in both cases; the silica in the knots was only one-sixth of the amount in the leaves: in all cases, weight for weight. What especially struck him was that the nodes were very much richer in potash than any other part of the plant, and that potash accounted for nearly two-fifths of the weight of the ash from the nodes.[7] So far as the author is aware, these observations,—and

[6] Pierre maintained an open mind on the "silica hypothesis." For modern views on the mechanical strength of plants, see F. R. Tubbs, in the *Annals of Botany*, 44:147–160 (January 1930), for barley straw; O. N. Purvis, in the *Journal of Agricultural Science*, 9:338–365 (October 1919), for *Dactylis glomerata* (cocksfoot; orchard grass); and E. J. Russell, *Soil Conditions and Plant Growth*, 108–109 (Ed. 6. London, 1932), for general observations. None of the foregoing mention Johnston, Norton, or Pierre.

[7] There is a considerable modern literature on the migration of nutrients, especially potassium, in plants. V. H. Morris and J. D. Sayre, in *Plant Physiology*, 10:565–568 (1935), have demonstrated a difference in the content of potassium in the top and bottom of stalks of corn (*Zea mays*).

F. J. Richards has favored the author with the following note: Potassium accumulations may be real or fictitious (E. S. Dowding, for spruce, in *Annals of Botany*, 39:459–474, April 1925, especially p. 467; Norah L. Penston, for potatoes,

the still more elaborate report published in 1866, for which each node was analyzed separately,—stand alone.

Alike in showing interest in the cinereal composition of knots, and in the more weighty problem of the variation in composition of different parts of the stem, these workers blazed two independent paths, apparently without attracting a single follower. No reference to their work has been found in any of the books on cereals available to the author, or in the pertinent papers that have been examined.[8]

Some of Pierre's figures may perhaps be considered as supporting the view put forward quite recently in a series of rather inaccessible papers by Professor N. T. Deleanu, of the University of Bucureşti, and his pupils.[9] They have found that a *Rück-*

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in *ibid.*, 45:673–692, October 1931). The latter are due to the association of potassium with vascular bundles which are numerous at the nodes, or to probable inclusion of axillary bud tissue which is extremely rich in potassium (cf. Sophia H. Eckerson, "Microchemical Studies in the Progressive Development of the Wheat Plant," Washington Agricultural Experiment Station *Bulletin 139*, 21 p., March 1917).

[8] Frank Knowles and J. E. Watkin, "The Assimilation and Translocation of Plant Nutrients in Wheat during Growth," in the *Journal of Agricultural Science*, 21:612–637 (October 1931). With regard to their own work, they wrote: "No similar investigation on an equally extensive scale is known to us, although allusion is made to some German work carried out in 1903." They then mentioned recent work on the development of the wheat grain, and referred to R. A. Berry, "Composition and Properties of Oat Grain and Straw," in *ibid.*, 10:359–414 (October 1920), who quoted A. P. Aitken, "Analyses of Oat-Straw and Oats," in the Highland and Agricultural Society of Scotland, *Transactions* (ser. 5), 13:284–295 (1901).

[9] The following are typical of several papers known to the author: N. T. Deleano, "Die Rückwanderung der Stickstoffsubstanz aus den Laubblättern und ihre Speicherung im Stamme und Wurzel [*Salix*]," in *Buletinul Societăţii de Ştiinţe din Cluj*, 7:45–59 (1932); N. T. Deleanu, "Migraţia negativă a substanţelor azotoase din frunze şi chestiunea acumulării lor în tulpină sau rădăcină [*Salix*]," with German summary, in *Academia Română Memoriile Secţiunii Ştiinţifice* (ser. 3) 9 (9), Bucureşti, 1934; I. Polovrăgeanu, "Contribuţiuni la studiul rolului şi funcţiunii substanţelor minerale şi organice in viata plantei II: Variatia cantitativă a substantelor minerale in cursul desvoltărei frunzelor de *Populus pyramidalis* şi *Robinia pseudoacacia*," with French summary, in *Universitatea din Bucureşti, Facultatea de Farmacie* (Mai 1933); and V. G. Bossie, "Contribuţiuni . . . in viata plantei IV: Variaţia cantitativă a substanţelor minerale şi organice in cursul desvoltării plantei şi repartiţia lor intre diversele organe. *Triticum vulgare*," with French summary, in *Facultatea de Farmacie, Laboratorul*

wanderung, migration négative, or "negative migration" of plant constituents occurs, whereby nitrogen and mineral elements are returned to the soil. This group has also shown that some non-legumes and the legume *Robinia pseudoacacia* return to the soil notable amounts of nitrogen. The phenomenon of return at the end of the growing season is distinct from the excretion of nitrogenous compounds during the early life of leguminous plants, studied by A. I. Virtanen, Synnöve von Hausen, and others in Finland, and by Dr. H. G. Thornton and the author at Rothamsted.[10] According to the Rumanian scientists, the wheat plant returns to the soil only a small proportion of the nitrogen it has taken up, but a large proportion of its potash. The graphs and summary tables given by Pierre for the variation per hectare seems to support Deleanu's ideas so far as wheat is concerned. The diminution of amount of constituents as the season advances, both for wheat and colza (*Brassica Napus* L.), was discussed by Pierre, with special reference to nitrogen and alkalies, on pages 109 and 113 of his 1863 paper, and also in his

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de Chimie Analitică Prof. Dr. N. T. Deleanu (1934). Bossie refers briefly to Pierre's work.

The author performed a few analyses of the ash of straw on Jan. 23, 1936 and found differences between the two ends in wheat, oats, and barley. He hopes to enlarge on this work, but without rivalling Pierre's extensiveness. At present the results are not numerous enough for publication. He has briefly confirmed the early work after a lapse of more than seventy years.

[10] Among the latest papers on this subject are: A. I. Virtanen, "Over de Stikstofvoeding der planten," in *Landbouwkundig Tijdschrift,* 47 (570):61–76 (February 1935); A. I. Virtanen and Synnöve von Hausen, in the *Journal of Agricultural Science,* 25:278–289 (April 1935); A. I. Virtanen, "The Chemistry of Grass Crops," in the *Journal of the Society of Chemical Industry,* 54:1015–1020 (November 1935); H. G. Thornton and Hugh Nicol, in *ibid.,* 24:269–282, 540–543 (April, October 1934). For a summary and discussion of many other related investigations, see Hugh Nicol, "The Derivation of the Nitrogen of Crop Plants, with Special Reference to Associated Growth," in *Biological Reviews,* 9:383–410 (October 1934), and "Mixed Cropping in Primitive Agriculture," in the *Empire Journal of Experimental Agriculture,* 3:189–195 (April 1935). Virtanen and others have shown this excretion to occur in the non-leguminous, but nodule-bearing, alder (*Alnus*). G. Bjälfve, in *Meddelande Nr 455 från Centralanstalten för försöksväsendet på jordbruksområdet. Bakteriologiska avdelningen Nr 65* (With English summary. Stockholm, 1935. 37 p.), has noted a leaching out of water-soluble nitrogenous compounds from peas, which seem difficult to distinguish from excretion.

1866 paper.[11] These discussions can now be seen to have considerable interest.

The type of work recorded in this paper is not without practical importance as two examples will show. A mill at Padalarang, Java, that specializes in making the best qualities of rice paper, uses only the straw of the ear and the upper end of the stalk for this purpose.[12] In 1933, at a staff colloquium held at Rothamsted, a worker concerned with the ratios of nutrients in fermentable materials asked for suggestions as to means for reducing the phosphorus content of ripe cereal straw below the usual average values. With Pierre's work in mind, the author suggested that a choice of the ends of straw would attain the desired result. This suggestion was gratefully received as a novelty, thus showing that the polarity of straw had been little recognized even at Rothamsted. At that time the author had not encountered any of the four studies here referred to except Pierre's first paper.

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[11] On the composition of colza at different stages of maturity, see also J. Reiset, *Recherches Pratiques et Expérimentales sur L'Agronomie* (Paris, J.-B. Baillière et Fils, 1863); Isidore Pierre, "Études sur le Colza," in *Annales de Chimie et de Physique* (ser. 3) 60:129–197 (Paris, 1860). A further communication by Pierre was mentioned by Reiset who said that he could find no details regarding it. Pierre's monograph of 1866 (see footnote 5) gives the following additional references: *Bulletin de la Société Linnéene de Normandie* (1859–60) 5:18–86 (Caen, 1860) [this article is identical in content with the one cited above]; (1861–62) 7:12–64 (Caen, 1862); (1862–63) 8 [printed as VII]:54–88 (Caen, 1864); *Recherches Agronomiques*, 1 vol. in 8 vo. 1863 (in the 1863 paper: *Recherches Agronomiques*, n.s. 1863).

[12] M. Welter, in a letter entitled "Quelques Renseignements sur les Papeteries de Padalarang" in the *Bulletin Économique de l'Indochine* (sect. B) 33:620–622 (August 1930), says: "Il semble important de signaler que la paille employée est constituée seulement par la partie supérieure des tiges, c'est-à-dire la partie qui porte les graines. La récolte du riz à Java se fait entièrement à la main, le riz est coupé tige par tige à l'aide d'un petit couteau et seule la partie supérieure des tiges est récoltée; le reste qui donne une paille plus grossière est abandonné sur les rizières et y est généralement brûlé."—For an abstract of this letter see the *International Review of Agriculture*, 22:50T (February 1931).

FRONTIER ECONOMY IN SOUTHWESTERN PENNSYLVANIA[1]

As the first area west of the Appalachian Mountains to be occupied by the advancing army of home seekers that was destined to sweep across the continent, southwestern Pennsylvania is of peculiar interest to the student of frontier economy. The characteristics of that economy in the region were in the main a result of its frontier status and consequently were similar to those of other areas in process of being occupied. They were intensified, however, by the isolation of the region from older settlements; and they differed from those of other frontier areas because of differences in the physical environment, in the cultural backgrounds of the pioneers, and in the scientific and technological equipment available during the period of occupation.

After a few preliminary advances and retreats, the army of occupation started to take possession of southwestern Pennsylvania about 1766. The settlers came in the main from the piedmont and valley sections of Virginia, Maryland, and Pennsylvania, where they had been accustomed to frontier conditions; and their antecedents were English, Scotch, Irish, and German. Topographically the region was a dissected plateau drained by the Monongahela and Allegheny rivers, which came together to form the Ohio at Pittsburgh. The soil was fertile, but a considerable part of the surface was too steep or broken for successful cultivation. Almost the entire area was heavily forested, and it abounded in wild animals, both game and predatory. The region had been visited by traders from across the mountains for a generation; two military routes, the Braddock Road and the Forbes Road, had been opened into it; and British troops had

[1] An address read before the joint meeting of the Agricultural History Society and the American Historical Association at Chattanooga, Tennessee, on December 27, 1935.

occupied Fort Pitt and other posts in it since 1758; but it was still in the main an unbroken wilderness when the settlers began to take possession. Although the claims of the Indians to the region were extinguished in 1768, their incursions were a menace to the pioneers during the greater part of the frontier period. Despite the difficulties involved in crossing the mountains and in establishing and maintaining homes in the wilderness, the population of the region rose rapidly from a few hundred in 1766 to about forty thousand in 1774 and then more slowly, especially during the Revolution, to about sixty-five thousand in 1790.

The motivating force back of this migration was predominantly economic. Some there were, especially among the first settlers, who were drawn by a love of adventure or of solitude or by a desire to escape the consequences of past conduct; but the great majority sought the opportunity to improve their economic status. This they expected to do by acquiring land and developing it into improved farms, which would provide old-age security for themselves and something to hand down to their children. It was not that they expected to make a better living, at least for some years to come, than they could in the East; but rather that they hoped to be able, while supporting themselves and their families, to acquire and create capital goods in the form of improved land, farm buildings, livestock, and equipment. Ultimately, of course, the durable wealth created by the pioneer would result in improved standards of living, at least for his children. The land in its wilderness state had comparatively little economic value; not until it was transformed into farms by the labors of the pioneers did it become productive capital; and it is probable that, during the frontier period, at least as much human energy was devoted to the creation of capital in the form of producers' goods as to the production of consumers' goods for the use of the producer or for sale or exchange.

Apparently a considerable proportion of the first settlers, however, were attracted more by the wilderness environment as they found it than by the opportunity of transforming it into improved farms. According to "a citizen of Pennsylvania,"

writing in the *Columbian Magazine* in 1786 about "the progress of population" in his State,

> The *first* settler in the woods is generally a man who has outlived his credit or fortune in the cultivated parts of the State. His time for migrating is in the month of April. His first object is to build a small cabbin of rough logs for himself and family. . . . A coarser building adjoining this cabbin affords a shelter to a cow, and pair of poor horses. The labor of erecting these buildings is succeeded by killing the trees on a few acres of ground near his cabbin; this is done by cutting a circle round the trees, two or three feet from the ground. The ground around these trees is then ploughed and Indian-corn planted in it. . . . His family is fed during the [*first*] summer by a small quantity of grain which he carries with him, and by fish and game. His cows and horses feed upon wild grass, or the succulent twigs of the woods. For the first year he endures a great deal of distress from hunger—cold—and a variety of accidental causes, but he seldom complains or sinks under them. As he lives in the neighborhood of Indians, he soon acquires a strong tincture of their manners. . . . His pleasures consist chiefly in fishing and hunting. He loves spirituous liquors, and he eats, drinks and sleeps in dirt and rags in his little cabbin. . . . In proportion as population increases around him, he becomes uneasy and dissatisfied. . . . He cannot bear to surrender up a single natural right for all the benefits of government,—and therefore he abandons his little settlement, and seeks a retreat in the woods, where he again submits to all the toils which have been mentioned.

Despite his unsocial character, the settler of the hunter-pioneer type made a beginning in the process of creating a farm. He was usually succeeded, according to the same writer, by a settler of a second species, who enlarged the cabin by an addition of hewn logs, cleared meadow-land, planted orchards, brought more land under cultivation, and raised wheat and rye as well as Indian corn.

> This species of settler by no means extracts all from the earth, which it is able and willing to give. His fields yield but a scanty encrease, owing to the ground not being sufficiently ploughed. The hopes of the year are often blasted by his cattle breaking through his half made fences, and destroying his grain. His horses perform but half the labor that might be expected from them, if they were better fed; and his cattle often die in the spring from the want of provision, and the delay of grass. . . . This species of settler . . . delights chiefly in company—sometimes drinks spirituous liquors to excess—will spend a day or two in every week, in attending political meetings; and, thus, he contracts debts, which (if they do not give him a place in the sheriff's docket) compel him to sell his plantation, generally in the course of a few years, to the *third* and last species of settler.
>
> This species of settler is commonly a man of property and good character . . . His first object is to convert every spot of ground, over which he is able to draw water, into meadow . . . His next object is to build a barn, which he prefers of

stone . . . very compact, so as to shut out the cold in winter; for our farmers find that their horses and cattle, when kept warm, do not require near as much food, as when they are exposed to the cold. He uses oeconomy, likewise, in the consumption of his wood. Hence he keeps himself warm in winter, by means of stoves, which save an immense deal of labour to himself and his horses, in cutting and hawling wood in cold and wet weather. His fences are every where repaired, so as to secure his grain from his own and his neighbour's cattle. But further, he encreases the number of the articles of his cultivation, and, instead of raising corn, wheat, and rye alone, he raises oats, buckweat . . . and spelts. Near his house, he allots an acre or two of ground for a garden, in which he raises a large quantity of cabbage and potatoes. His newly cleared fields afford him every year a large encrease of turnips. Over the spring which supplies him with water, he builds a milk-house: he likewise adds to the number, and improves the quality of his fruit-trees. . . . The last object of his industry is to build a dwelling-house. This business is sometimes effected in the course of his life, but is oftener bequeathed to his son, or the inheritor of his plantation . . . The horses and cattle of this species of settler, bear marks in their strength, fat, and fruitfulness—of their being plentifully fed and carefully kept. His table abounds with a variety of the best provisions—his very kitchen flows with milk and honey—beer, cyder, and wine are the usual drinks of his family.

That this progression of farmers of three distinct types occurred with anything approaching uniformity in southwestern Pennsylvania may be doubted. The writer himself admits that there were exceptions to it.

I have known some instances where the first settler has performed the improvements of the second, and yielded to the third. I have known a few instances likewise, of men of enterprizing spirits, who have settled in the wilderness, and who, in the course of a single life, have advanced through all the intermediate stages of improvement that I have mentioned, and produced all those conveniences which have been ascribed to the third species of settlers . . . There are instances, likewise, where the first settlement has been improved by the same family, in hereditary succession, 'till it has reached the third stage of cultivation.

It should be added that in some cases land speculators, as for example George Washington, sent out gangs of indentured servants and slaves under overseers to make the first clearings and erect log houses on their properties, after which the incipient farms were sold or leased to settlers. There were instances also in which well-to-do settlers, using slave labor in part, created plantations with mansion houses and many acres of cleared land in a comparatively short time. There is plenty of evidence, however, that farms and farmers of each of the described types, and of intermediate types, were to be found in the region during

the frontier period; and it is clear that, in most cases, more than a generation was required to advance a farm to the state in which it produced much surplus.

If agriculture be understood to include the making of farms and the domestic industries that were conducted on them as well as the production of crops and the raising of livestock, then the economy of southwestern Pennsylvania was almost wholly agricultural during the frontier period. Pittsburgh had fewer than four hundred inhabitants in 1790, and the half dozen other villages were even smaller. It is probable that at least ninety-five percent of the inhabitants lived on farms at that date, though some of the farmers were also millers, tavern-keepers, ferrymen, boatbuilders, or even preachers. On the other hand some of the professional men and merchants in the villages were also farmers, and practically all the villagers at least kept a cow or two and cultivated a garden. From an examination of tax records and descriptions of farms in newspaper advertisements it appears that farms of about three hundred acres, of which perhaps forty acres were under cultivation and a somewhat smaller amount in meadow, were common in southwestern Pennsylvania around 1790. On such farms, as a rule, would be found two horses, three or four head of cattle, and four or five sheep, though perhaps a third of the farmers had no sheep. As early as 1781, however, General John Neville had ten horses, sixteen head of cattle, and twenty-three sheep on his thousand-acre estate near Pittsburgh. On the other hand, as late as 1790 there were still many farmers in the region who possessed only one horse and one cow.

The earliest farms were, of course, essentially self-sufficing units. Because of the isolation of the region and of the individual farms, it was more economical to produce at home the necessary commodities, makeshifts though they might be, than to transport surplus crops to a distant market and bring back the goods received in exchange; and this was true whether the transportation were done by the farmer himself or by a middleman. Moreover, in the early stages of the making of a farm, when only a few acres had been cleared and much of the energy

of the farmer was devoted to clearing more, little surplus was produced. It should be remembered, also, that domestic industries flourished at this time in all parts of the country and even in Europe: the age of specialization was only in its infancy.

Each farm unit, therefore, was the scene of a wide variety of activities; and, since neither labor for hire nor money to pay for it was available, the work was done by the farmer and his family, with occasionally an indentured servant to help them, and everyone had to be a jack-of-all-trades. Such division of labor as there was was based on sex and on age or strength. To the men fell the tasks of hunting and fishing, clearing the land, erecting buildings and fences, plowing, cultivating, harvesting, threshing, grinding, shearing sheep, and providing firewood, together with such domestic industries as butchering, smoking meat, making maple sugar, blacksmithing, coopering, cabinet making, tanning, and shoemaking. The tasks of the women included the care of the stock, except perhaps the work animals, and of the poultry, as well as the preparation of food, the making of clothing, and the care of the house and the children. They did the baking, brewing, churning, spinning, dyeing, weaving, knitting, and made the garments, candles, soap, and cheese, in addition to cooking the daily meals and occasionally nursing the sick. The children, even very young ones, could assist their elders at the tasks of the farm and the household, and, as the work was never-ending, the parents were spared the modern domestic problem of finding something for the youngsters to do. Moreover, the children were learning by the laboratory method the processes that they would need to know when they set up their own households, and some of them were developing skills that would enable them later to specialize as artisans.

These frontier farms were never completely self-sufficing, of course. From the very beginning of settlement, iron and glass, salt and spices, and a few luxuries were brought over the mountains, at first on the backs of pack horses and later in wagons. Once a year, in the early period, an expedition from each neighborhood made the trip to the East to get the necessary supplies. About the only commodities produced in the region of sufficient

value in proportion to their weight to warrant their being transported across the mountains to balance the imports were furs, whiskey, and ginseng. Cattle were sometimes driven to market, but the trip was so hard on them that they could not compete successfully with eastern and southern cattle. A small local market for more bulky products was supplied by immigrants and by the military establishments, but the payments in Continental currency during the Revolution were not relished by the farmers. About the close of the war farmers and merchants began to make occasional shipments of grain, flour, pork, and beef down the Ohio and Mississippi rivers to New Orleans, where, if the Spanish officials happened to be agreeable, such products could be disposed of for cash; but the restrictions imposed upon this trade and the danger from the Indians prevented any considerable development of it until after 1795. Most of the money received for the sale of products was quickly drained out of the region in payments for land or for imported commodities.

The most notable development in the field of commerce during the years immediately following the Revolution was the advent of the general store. Stores of a sort had existed in Pittsburgh ever since the place was occupied by the British under General Forbes in 1758, but the early ones were concerned primarily with the Indian trade, though they also catered to the soldiers, occasional travelers, immigrants, and nearby settlers. The improvement of roads, the development of agricultural surpluses, and the increase of migration through the region after the Revolution made it practicable for merchants to import larger and more varied stocks of goods and to offer them for sale or barter not only in Pittsburgh but also in the other villages such as Washington, Brownsville, and Uniontown. There were eight general stores in Pittsburgh in 1784 and another was about to be established.

The founding in 1786 of the *Pittsburgh Gazette*, the first newspaper west of the mountains, enabled the merchants to advertise their wares, and the fortunate preservation of files of that paper makes available information as to the character of the stocks. An assortment of goods offered by Terrence Campbell in his new

store in Washington in 1788 contained fifty varieties of cloth, including broadcloths, serges, cottons, flannels, velvets, jeans, and linens; fifteen articles of wearing apparel, such as hats, shoes, gloves, aprons, shawls, and hose; one hundred and twenty-five items of hardware and notions, including looking-glasses, snuff-boxes, pistols, scalping knives, scissors, combs, spectacles, brushes, carpenters' and sliding rules, inkpots, watch chains, jew's-harps, fiddles, candlesticks, flatirons, china, axes, tongs, sickles and scythes, and artificial flowers; and twenty-five articles of food or staples, such as coffee, tea, chocolate, spices, tobacco and snuff, indigo, German and Crowley steel, bar iron and castings, and gunpowder. The more or less permanent stores were supplemented by wandering merchants, who hauled their "ventures" across the mountains and moved them about from place to place by wagon or by flatboat until they were disposed of.

It is significant of the lack of money in the region that nearly every merchant offered to accept "cash or country produce" for his merchandise. One storekeeper in Pittsburgh elaborated the familiar phrase in 1786 into "cash, flour, whiskey, beef, pork, bacon, wheat, rye, oats, corn, ashes, candlewick, tallow, &c. &c." Ginseng, snakeroot, skins and furs, and "country linen" were also accepted, and sometimes cash was offered for ginseng. Goods were often sold on credit, and there is evidence in the advertisements that collections were frequently difficult. Apparently the merchants disposed of the bulky products they received in exchange for imported goods to villagers or immigrants or shipped them down the rivers to the New Orleans market. Furs, ginseng, and whiskey were sent east in the wagons that brought out the merchandise.

Within less than a decade after the first permanent settlements, diversification of activities began to develop within the region itself. Sawmills, boatyards, and blacksmith shops were in operation for the benefit of traders and the army even before the advent of permanent agricultural settlers; mills for the grinding of grain soon made their appearance in every considerable neighborhood, to be followed a little later by fulling mills; weaving and distilling tended to concentrate in the hands of those

who were more skillful or had better equipment than the average; and itinerant shoemakers and tinkers began to relieve the farmers of difficult tasks. Most of these industries were operated on a custom basis, and payment for the work was usually in the form of raw materials. The mills were run by water power as a rule, though occasionally horse power was used.

About the close of the Revolution artisans of many sorts began to set up their shops in the villages. From advertisements in the *Gazette* it appears that by 1790 Pittsburgh could boast of carpenters, coopers, wagonmakers, and cabinet and chair makers; tanners, curriers, cobblers, and saddlers; distillers, vintners, and bakers; tailors and hatters; watch and clock makers and gold and silversmiths; masons and quarrymen; ropemakers; and printers. Most of these artisans did their work in their homes or small shops, with sometimes an apprentice or two to help them, and like the merchants they were often obliged to accept country produce for their wares. Doubtless there was also considerable exchange of commodities among artisans and of stock and produce among farmers; and it is significant of the growing internal trade that a market house was erected and regular market days were established at Pittsburgh in 1787.

The transformation of southwestern Pennsylvania from an isolated frontier community made up of self-sufficing agricultural units to one of specialized activities integrated with the national economy went on apace during the last decade of the eighteenth century. Several factors contributed to the acceleration of this movement. As the farmers increased their acreages of improved land, the agricultural surpluses became larger and larger. The armies of the United States operating against the Indians in the Northwest Territory from 1790 to 1794 furnished a cash market for much of this surplus, and the immigrants that poured into that territory after the Indian wars were over usually bought their equipment and supplies for the first season in southwestern Pennsylvania. In 1794 the Whiskey Insurrection brought another Federal army into the region, for which supplies had to be purchased locally. These outlets were temporary, of course, for the armies were disbanded and the immigrants were soon

producing surpluses of their own; but the removal of restrictions on the Mississippi trade effected by Pinckney's Treaty in 1795 opened the markets of the world to the farmers and merchants of the West. Flatboats and keelboats made their way to New Orleans from the upper Ohio in ever increasing numbers, and before the end of the century ocean-going ships had been built in western Pennsylvania, loaded with the produce of the region, floated down the rivers, and sailed out on the high seas. In this period also the improvement of the highway from Philadelphia to Pittsburgh, largely at the expense of the State, and the extension and improvement of local roads decreased the cost of wagon transportation and greatly facilitated the introduction and distribution of eastern commodities.

Most significant, however, of the changing economy of the region was the beginning of manufacturing as distinguished from the custom, handicraft, and domestic industries. With a market available for flour, merchant mills made their appearance in the towns and began to purchase grain with cash or with warehouse certificates, which circulated as currency. Large-scale breweries and distilleries also began to operate on a merchant basis. The first blast furnace for the manufacture of iron was blown in in Fayette County in 1790, and by the end of the decade sixteen ironworks had been established in the region. Most of these were furnaces and forges combined, but there were several bloomeries and one slitting mill. The products were castings and bar iron. As a rule these works were located in rural districts near the westernmost ridges of the Appalachian Mountains, where local ores and wood for charcoal were available—both commodities that have no part in the present-day iron and steel industry of the region. A paper mill began operations at Brownsville in 1796, and two glass factories with imported workmen were established in 1797, one by General James O'Hara near Pittsburgh and the other by Albert Gallatin at New Geneva. Coal from surface pits had been used in the region for heating purposes and in forges from a very early day; it was used in the manufacture of glass at O'Hara's works from the start; but it was not substituted for charcoal in the blast furnaces

until many years later; and its use as a source of power had to await the construction of the first steam engine in the region in 1808. The products of the furnaces and factories not only supplied the needs of the people of the region for such commodities but also found their way down stream to the newer settlements farther west and in some cases even to New Orleans.

Southwestern Pennsylvania was still predominantly agricultural at the end of the eighteenth century, but the process of making the farms was approaching completion, commerce both internal and external was well established, and manufacturing and mining were being developed. The population of the district had arisen to about a hundred thousand. Pittsburgh, its metropolis, was a thriving commerical and industrial center with 1,565 inhabitants. A visitor of 1800 reported that he "found the town, which was called the Western Exchange, a reflex of New York, the same earnest bustle in the business, and the same national variety in its thickly thronging strangers." In approximately a third of a century the region had been transformed from a wilderness to the habitat of a numerous human society well supplied with capital goods in the shape of improved farms, roads, buildings, and factories, and equipped with a complex economic structure. The frontier stage in the development of the region had been completed.

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UKRAINIAN FARMERS IN THE UNITED STATES[1]

The history of the Ukrainian people has many contrasts. Their homeland is a vast territory abounding in riches, including navigable rivers, minerals, forests, and fertile soils. Scholars have variously estimated the number of Ukrainians, but all agree that there are at least forty million. They are enterprising, hard-working, thrifty, and gifted with native intelligence. Yet, having lost political independence at the close of the Middle Ages, they have had no generation able to regain it. Although

[1] This article is an expansion of research embodied in the author's doctoral dissertation for the University of Iowa on "Economic Aspects of Ukrainian Activity in the United States" (Iowa City, 1934). For an abstract, see the University of Iowa Studies in the Social Sciences, 10 (3), *Abstracts in History*, 2:95–103 (Iowa City, 1934).

The dissertation includes the most complete bibliography on the Ukrainians in America thus far compiled. The following are some of the more important sources not specifically referred to in the footnotes of this article. *Documents*:—*Dictionary of Races or Peoples*, 116–118 (61 Congress, 3 session, *Senate Documents*, no. 662). *Statistical Review of Immigration, 1820–1910; Distribution of Immigrants, 1850–1900* (61 Congress, 3 session, *Senate Documents*, no. 756). U. S. Bureau of Immigration, *Annual Report of the Commissioner-General*, 1899–1930. *Articles*:—"Birth of the Ukrainian Republic," in *Literary Digest*, 56 (8):7–8 (Feb. 23, 1918). "Ukrainians in America," in *ibid.*, 63 (7):40 (Nov. 15, 1919). Ivan Ardan, "The Ruthenians in America," in *Charities*, 13:246–252 (Dec. 3, 1904). E. G. Balch, "Slav Emigration at Its Source," in *ibid.*, 16:171–183 (May 5, 1906). *Calendar of the Orphan's Home* (in Ukrainian. Philadelphia, 1935). *Calendar of Ukrainian Workingmen's Association* (in Ukrainian. Scranton, Pa., 1935, 1936). Nicholas Ceglinsky, "How the Ukrainians Came," in *Interpreter*, 3 (1):5–7 (January 1924), and "Ukrainians in America," in *ibid.*, 3 (12):4–7 (December 1924). *Books*:—Emily G. Balch, *Our Slavic Fellow Citizens* (New York, 1910). Jerome Davis, *The Russians and Ruthenians in America* (New York, 1922). H. P. Fairchild, *Immigrant Backgrounds* (New York, 1927). Michailo Hrushevsky, *Iliustrovana Istoria Ukraini* (Winnipeg, n.d.). Orest Kirilenko, *Ukraintse w Ameritsi* (Vienna, 1916). Archibald McClure, *Leadership of the New America, Racial and Religious* (New York, 1916). D. S. Mirsky, *Russia, A Social History* (New York, 1932). Luke Myshuha, *Pripamiatna Kniha* (Jersey City, N. J., c. 1936). Stephen Rudnitzky, *Ukraine, the Land and Its People* (New York, 1918). Charles H. Young, *The Ukrainian Canadians* (Toronto, 1931).

the Ukrainians have produced some noted men of science, music, and literature, they have failed to develop Masaryks. The obvious enemies of an independent Ukraine have been the Poles, the Russians, and the Rumanians, who partitioned the country among themselves. However, in recent years even such remote countries as France and Germany have revealed their designs upon the Ukraine.

Without political independence, the people were hindered in their cultural and economic development. Even the use of the names "Ukraine" and "Ukrainians" was prohibited by the Russian overlords who misruled the country for nearly three hundred years. The Polish reign over the Ukrainians in East Galicia is thus described by an eminent English author: "The Ukrainian nobility (boyary) were either Polonized or exterminated, the middle-class was destroyed; the Ukrainian cities were Polonized and church property plundered. The Ukrainian peasants were deprived of personal liberty, converted into serfs, and became the absolute property of the Polish nobility."[2] Compulsion on the one hand and the desire to gain political and social advantages on the other led the Ukrainians of the higher classes to renounce their nationality in favor of the Polish or the Russian. The masses, on the other hand, though poor, abused, and kept in ignorance, remained Ukrainian, and they produced a folklore of which any nation would be proud. Along with folk songs and folk dances, they developed handicraft and domestic arts, and also made contributions to music, art, literature, and science.

The soil of Ukraine has been much publicized for its productivity, but it was held mostly by Russified or Polonized nobles who exploited the people. The small privately-owned farms suffered further division with each succeeding generation. Since there were no industries, the people had to remain farmers, and as it was impossible to make a living on the small strips of land, the young men sought seasonal employment in the cities and even in foreign countries. The mass emigration to the New World which followed was likewise for the most part due to

[2] H. Hessell Tiltman, *Peasant Europe*, 223 (London, 1934).

economic maladjustment. Long periods of compulsory military service and political and religious persecution also contributed.

Although political exiles from the Ukraine had found refuge in the United States before the close of the American Civil War, it was not until 1877 that Ukrainians began to migrate to America in any considerable number. This immigration increased as the years went by until the Ukrainians became one of the important elements of the immigrant stream. The reports of steady employment, high wages, an abundance of good land, and personal freedom in the United States were a stimulus. By the close of the nineteenth century emigration from the Ukraine assumed the character of a mass movement. The people went not only to the United States, but to Canada, Brazil, and Argentina. There is hardly a village in western Ukraine, commonly known as East Galicia, from which scores did not emigrate to the United States. In some instances, a single household furnished three or four persons; in others, the entire family left for America. The agents of steamship lines did all within their power to stimulate the exodus as it meant commissions for themselves as well as larger receipts for their companies. The efforts of the ruling classes to stop this emigration proved ineffective.

Prior to 1899 the United States immigration authorities kept a record of the country from which the immigrants came rather than a record of the nationality of the immigrants. Since various countries of Europe ruled over several nationalities, it is impossible to make more than general statements concerning the number of each national group that came to the United States before that time. This is especially true of the Slavic immigrants. In the case of the Ukrainians, the immigration records and the reports of the United States Census are of little help as many continued to give their nationality as Russian or Austrian since they had used Russian or Austrian passports; there were also many who retained the archaic Ruthenian or Carpatho-Russian classification, a practice which complicates research and makes it difficult to assemble reliable data. The immigration records show that 147,375 Ruthenians (Ukrainians) were admitted to the United States during the decade 1899 to

1910; this number does not include those whose nationality was given as Russian, Austrian, or in some cases Polish and Slovak. According to the same records, 268,311 Ruthenians (Ukrainians) entered the United States during the years 1899–1930.

The United States Census for 1930 reported close to 70,000 Ukrainians, including some nine thousand Ruthenians. Yet the current membership of Ukrainian religious denominations is about 500,000. By adding 80 percent of those who gave their nationality as Russian, one finds it possible to arrive at a nearly correct figure, namely 700,000. This number includes the children and grandchildren as well as the original immigrants. They are scattered throughout the country, except in the southeast, Pennsylvania, New York, Ohio, Illinois, and Michigan having the largest number. A majority have turned to trades, factories, mines, railroads, and forests for a livelihood. A small number are engaged in business and professions.

Although agriculture was the main economic interest in the homeland, the Ukrainian immigrants did not always turn to farming on their arrival in the United States.[3] The country and its language was strange to them. Practically all were without the capital necessary to start farming, and they were afraid to purchase land on borrowed money. The result was that a considerable number who ultimately became farmers worked in industries for several years to accumulate the necessary capital. On the other hand, an equally large number emigrated with their families from the provinces of East Galicia, Bucovina, and Kiev with the definite purpose of becoming farmers in the new land. They were, for the most part, the people who took up homesteads in North Dakota, Montana, and Canada.

In the beginning, Ukrainian farming in America was an individual rather than a group undertaking, and this feature was characteristic for many years. As there was no organization to

[3] According to the authority on Ukrainian geography, Dr. Stephen Rudnitzky, in his *Pochatkova Geografia*, 82 (Kiev, 1919), more than eight of every ten people in the Ukraine were farmers. For a similar statement, see Emil Revyuk, *Ukraine and the Ukrainians*, 17 (Washington, D. C., 1920).

guide or direct the immigrants to farms, their agricultural communities were settled sporadically and are widely scattered.[4] There was likewise no Ukrainian government to encourage or aid the formation of agricultural colonies in America.[5] An individual, having bought a farm in a community that pleased him, informed relatives and friends who followed him. Occasionally these pioneer farmers appealed to their countrymen through the Ukrainian press in America. They pointed to the advantages of farm life as compared with the dangerous and unsanitary conditions in the mines and mills. Their strongest points of appeal were the independence of farmers and the satisfaction of owning land. Such arguments impressed Ukrainian immigrants favorably as they were individualists by nature.

Although a few settled on farms immediately after the Civil War, the main movement to the land took place during the years after 1890.[6] It slackened for a time during the World War, apparently because of the high wages in industrial centers and because many were serving in the American army. This was

[4] The following settlements and villages have a large Ukrainian agricultural population: *Connecticut*,—Colchester, Willimantic. *Georgia*,—Nitra. *Iowa*,—Lovilia, Osage. *Maryland*,—Chesapeake City, Curtis Bay. *Massachusetts*,—South Deerfield. *Michigan*,—Copemish, Fosters, Fruitport, Pinconning, Saline. *Minnesota*,—Barnum, Osseo, Royalton. *Missouri*,—Desloge. *Montana*,—Giltedge, Larslan, Sand Creek, Scobey. *New Jersey*,—Blairstown, Great Meadows, Johnsonburg, Millville, Newton, Nova Ukraina. *New York*,—Babylon, Broadalbin, Churchville, Durhamville, Far Rockaway, Galway, Glenfield, Lee Center, Mattituck, Middleburg, Orient, Riverhead, Roslyn, Spring Valley, Stapleton, Woodhaven. *North Dakota*,—Backoo, Belfield, Benedict, Butte, Caledonia, Casselton, Douglas, Fayette, Fredonia, Fried, Fryburg, Gorham, Grassy Butte, Kief, Killdeer, Kongsberg, Makoti, Mary, Max, Oakdale, Pembina, Raleigh, Ruso, Ryder, Snow, Ukraina, Williston, Wilton. *Oklahoma*,—Harrah, Hartshorne, Jones, Prague. *Oregon*,—Eugene. *Pennsylvania*,—Albion, Doylestown, Smithmill. *Texas*,—Anderson, Bremond, Dundee, Marlin, New Waverly, Schulenburg. *Vermont*,—Manchester (near), Rutland. *Virginia*,—Yale. *Washington*,—Cedar Valley, Ravensdale. *West Virginia*,—Wheeling (near). *Wisconsin*,—Clayton, Cornucopia, Huron, Lublin, Suring, Thorp. *Wyoming*,—Frontier, Rock Springs, Sublet.

[5] Julian Batchinsky, *Ukrainska Immigracia w Zyedinenich Derzhavach Ameriky*, 1:167–168 (Lwów, Poland, 1914), recorded that the Ukrainian paper, *America*, no. 31 (1889), advocated the establishment of Ukrainian agricultural communities.

[6] Rev. Nestor Dmytrov, in the *Svoboda* (Jersey City), Feb. 16, 1899, mentions a Ukrainian farmer whom he met in 1895 near Troy, N. Y., who had been in the

particularly true of the Ukrainians of Chicago who had been moving to farms in Indiana and Wisconsin.

When the Ukrainians turned to farming, the best land was already occupied, and they had to take what was left. There were several alternatives, the purchase of developed farms with modern buildings, the acquisition of barren and cut-over land, much of it unfit for settlement, or homesteading in the Dakotas, Montana, and Wyoming. Lack of capital prevented the purchase of high-priced improved farms. Yet, it is interesting to note that most of the Ukrainian farmers in America are landowners, the number of renters and hired laborers being insignificant.[7]

The Ukrainian farmers in New England are widely scattered.[8] Individuals have been farming there for nearly fifty years; group settlements, however, are a more recent development. Many bought so-called abandoned farms, and just as the New Englanders of early colonial times turned to the sea or moved westward, so many of their Ukrainian and other Slavic successors who settled on the same farms two hundred and fifty years later were forced to supplement the family income from elsewhere. Many of them worked in factories of the nearby cities where there was employment, and tended the farms part-time and with the help of their families. Frequently the men worked in the mills during the day and returned to their farms in the evening. Such part-time farmers are common along the coast.

One of the largest Ukrainian rural settlements of New England is at South Deerfield, Massachusetts.[9] Other groups of consid-

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United States since 1864, but he did not state if the man had lived on the farm all of that time.

According to the *Spominki Ahapia Honcharenka*, 34 (Kolomea, 1894), he purchased a farm 26 miles north of San Francisco from his fellow countryman, Joseph Krishevsky, in 1872.

[7] At first about 200 Ukrainian farmers in the South rented their farms. John Kovalsky, in the *Svoboda* (Scranton), July 27, 1905, p. 7. A small number in North Dakota rent their farms, especially in the vicinity of Tower City. Letter from Amelia Weshnevsky to the author, Aug. 24, 1933.

[8] Letter from Rev. Theodore Halenda to the author, Mar. 8, 1932.

[9] Letter from Mary Pasichnyk to the author, Feb. 8, 1932; "Ukrainians in Colchester," in *Narodne Slovo* (Pittsburgh), Mar. 24, 1932.

erable size are located near Colchester and Willimantic, Connecticut, Rutland, Vermont, and Manchester, New Hampshire. These communities have about forty Ukrainian farmers each and support their own churches and other social institutions. Like other immigrant farmers in this section, they experiment in an effort to get the most out of the soil and make it pay. In many cases they are successful and make a living from their small farms. Those situated near the cities confine their attention to gardening, poultry, dairying, and hog raising as they have a market near at hand. The settlements in the interior also raise grain crops. Wherever possible, they till the soil intensively.

The State of New York has the largest number of Ukrainian agricultural communities. Long Island is dotted with farms operated by Ukrainians, and several of their settlements are large.[10] Here their farms are small, being about 10 acres in extent, and are confined to truck crops. In spite of the size, the farms are profitable, for New York City and its suburbs furnish a ready market for fresh vegetables, fruits, and poultry in normal times.[11] Long Island potatoes are well known in the metropolis. The farmers also raise beans, beets, cucumbers, tomatoes, cabbages, parsnips, carrots, garlic, and other garden products. Large trucks come each day during the growing season to collect the produce and haul it to market. These small farmers are better off than their fellow countrymen who work at manual labor in nearby cities, and they are well satisfied; rarely do they complain. Scientific methods of farming are used whenever possible, and the Ukrainians take better care of their machinery than do the native Americans. The farm houses do not differ from those of Americans except that flowers are grown in profusion about them. There are also a few Ukrainian communities in the central part of the State, the most important being in the vicinity of Galway, Broadalbin, Lee Center, Glenfield, Spring Valley, and Durhamville.[12] These Ukrainians are

[10] Lev Yasenchuk, *Za Oceanom* (Lwów, 1930).

[11] One farmer on a small Long Island farm sold his bean crop for $4,000. *Ibid.*, 134.

[12] At Durhamville they settled in a community of Hungarians. The largest settlement is near Broadalbin where there are close to one hundred families. The *Svoboda* (Jersey City), May 24, 1933.

engaged primarily in dairying and fruit raising,[13] and their farms are much larger and more profitable than those in New England, the average being probably 90 acres. Most of the Ukrainian farming communities in New York were started during the decade 1910–1920.

New Jersey has a considerable number of Ukrainian farmers in various parts of the State. The oldest rural settlement started about 1908 in the vicinity of Great Meadows. The first to go there were laborers on the truck farms. Year after year, new immigrants joined them, mostly from two villages in the Ukraine, until they became quite numerous. At first they worked for wages or on a percentage basis, saved money, and eventually bought land from their American employers, gradually forcing them out of the community. The extent of this penetration is seen in the enrollment at the Alafeno rural school. As late as 1912 almost all of the children were of American stock, while in 1934, out of seventy-five pupils, only one was of American ancestry, all others being children of Ukrainian and Polish immigrants.[14]

The largest colony in New Jersey is near Millville in the southern part of the State, and its story is slightly different. About 1912 a Ukrainian real-estate agent named Metolich began to advertise land for sale in that vicinity in the *Svoboda* (Jersey City). The advertisement was so appealing, one might say sugar-coated, that its influence was felt not only in the nearby urban centers but also in far-away North Dakota. A number of Dakota farmers sold their large farms and moved to Millville where they purchased small strips of land. Many soon became dissatisfied with their new holdings and complained that the land had been over-advertised and even misrepresented, but it was too late to mend matters.[15] About two hundred families

[13] Letter from Wasyl Habal to the author, Apr. 23, 1932.

[14] *Svoboda* (Jersey City), Dec. 19, 1933; letter from Paul Landiak to the author, Jan. 2, 1934. According to Landiak, the locality has close to seventy-five Ukrainian families with farms varying in size from 25 to 600 acres.

[15] At a meeting in the home of N. Hevchuk on Apr. 5, 1914, the following resolution of complaint was adopted: "1. All of us suffered due to false advertising of land in the *Svoboda* paper. 2. We wish to warn our fellow countrymen not to heed such false advertising and come here to buy land." It was signed by sixteen men and printed in the *Narodna Wola* (Scranton), Aug. 14, 1914.

built homes, farm buildings, churches, and schools at Millville. After the first years of hardship they became more contented and remained. Their farms are small, being 10 or more acres in extent, but the sandy soil is productive and easily cultivated. Many of the farmers grow truck crops.[16] Nova Ukraina, a newer and smaller settlement, is near Plainfield.

In Pennsylvania the Ukrainian farmers are scattered.[17] Some of them are former urban residents who disliked city life and turned back to the soil. In mining regions from which the coal has been removed, the mining companies have sold land to their former workers, the Ukrainian, Slovak, and other Slavic immigrants, at a very low price.[18] Very often the growing timber was worth the price paid for the land. It supplied lumber for farm buildings, and often there was also some for sale. This sort of land is usually hilly, but many of the Ukrainians were accustomed to such topography, having come from the Carpathian region of the homeland. At first, they sought part-time work in the mines, but as mining receded farther and farther from their homes, they had to devote their full time to farming. Through hard work by the entire family they were able to sustain themselves, and today they continue to cultivate their hilly farms intensively wherever possible, and to raise cattle, hogs, and sheep. Besides these individual farmers scattered through the State, there are large Ukrainian agricultural communities at Doylestown and Albion, the latter having nearly seventy families.[19] In these communities every farmer owns his farm, and few of them are mortgaged. The crops are widely diversified.

The Protestant refugees who fled from the province of Kiev to escape the religious persecution of Czar Alexander III and the

[16] Stepan Museychuk, "Impressions of Our Farm Life," in *Svoboda* (Jersey City), July 13, 1931.

[17] For details on the Ukrainians of Pennsylvania in industries other than farming, see Wasyl Halich, "Ukrainians in Western Pennsylvania," in *Western Pennsylvania Historical Magazine*, 18:139–146 (June 1935).

[18] At first the farms consisted of 10 to 20 acres and they were purchased for $5.00 per acre. Batchinsky, *Ukrainska Immigracia*, 1:172–174.

[19] The same community has Polish and Slovak farmers. Letter from John J. Ulan, Jr., to the author, Feb. 6, 1932.

Russian Orthodox Church constitute an important as well as interesting element of the Ukrainian immigration. Some of them came to America as early as 1885 and 1887. They worked in the manufacturing districts of Philadelphia until they had accumulated sufficient money, and then they began farming near Yale, Virginia, in 1894.[20] A number of Ukrainian farmers also settled at York, Virginia, and at Curtis Bay, Maryland. Their farms consist of 10 to 40 acres of partly cleared land with poultry as the chief source of income. Many of the families still rely primarily on the cities for their earnings. Several are storekeepers, bakers, and contractors.[21]

Occasionally unscrupulous agents of steamship companies ignored the destination selected by Ukrainian emigrants and sold them tickets on ships to places far distant from where they had expected to go. Two of these agents, Potocki and Missler, of the North German Lloyd line, surpassed all others in this evil doing. Some were even transported to the Hawaiian Islands where they were reduced to a position of servitude on the plantations. Finally, through the threatened intervention of the United States Government, they were set free, and several migrated at once to San Francisco.[22]

In this way many of the Ukrainians who had no intention of settling in the Southern States found themselves stranded there. In 1896, nineteen families from East Galicia were routed to Georgia by Missler rather than to Canada as they had planned. Within a few months four of these families made their way to Philadelphia where they brought charges before the Austrian consul against the North German Lloyd Company. The others, however, remained in Georgia, and having purchased abandoned plantation land near Nitra, they turned to fruit raising.[23]

In the same year, agents of the North German Lloyd Company shipped a large group to Texas instead of to Canada where they

[20] Letter from Andrew Dubovay to the author, Nov. 12, 1932.
[21] Letter from S. C. Malin to the author, Feb. 9, 1932.
[22] Letter from Dmytro Puchalsky to the author, Oct. 16, 1932.
[23] Batchinsky, *Ukrainska Immigracia*, 1:176–177.

had expected to take up homesteads.[24] On reaching Texas the poor immigrants discovered the treachery. As there was no free land available and they had to do something at once, they turned to the cotton plantations, the railroads, and the coal mines. While looking for work, they discovered Polish communities and settled near them. Since they had no ready cash to buy farms, they rented abandoned plantation land on a share basis. Most of them are still renters. The largest Ukrainian farm settlements in Texas are near Bremond, Anderson, Marlin, New Waverly, Schulenburg, and Dundee. In most of these communities they raise tobacco, cotton, and grain.[25]

Many of the Ukrainians were not contented in Texas. The most frequent complaints were against the heat, the poor water, and the snakes. When Oklahoma was opened to settlement, they, in company with thousands of native Americans, rushed there, and Oklahoma now has several hundred Ukrainian farmers, the largest settlements being at Harrah and Jones.[26] Arkansas and Missouri have a number of widely scattered Ukrainian farmers. In the latter State, there are large groups in the mining region near Desloge and St. Francois.

Michigan and Wisconsin have received Ukrainian farmers for nearly forty years. In Michigan, the Ukrainian communities are found at Copemish, Fruitport, Pinconning, and Saline.[27] Here most of the Ukrainians bought wooded land without buildings and converted it into fruit and corn (in the American sense) farms, and there are now over two hundred families living on them. When the Ukrainians began to settle in Wisconsin in the

[24] Some accounts state that the first group that reached Texas in 1896 consisted of sixty families; others say that there were more than a hundred. The agents transported them to the vicinity of Vernon. Letter from Rev. A. Revera to the author, Oct. 19, 1932.

[25] Batchinsky, *Ukrainska Immigracia*, 1:177–178.

[26] The migration from Texas to Oklahoma started in September 1905. Today, except for the two organized communities of Harrah and Jones, most of the immigrants are widely scattered throughout the State, and they have lost nearly all of their national identity among the Poles, Czechs, and Croats. Letter from Rev. A. Revera to the author, Oct. 19, 1932.

[27] Letter from Rev. Lev J. Sembratovich to the author, Mar. 22, 1932.

late nineties, about the only land available at a low price was the cut-over land in the northern part. They helped each other clear away the stumps and underbrush, and eventually, after years of hardship, they came to enjoy a moderate degree of prosperity. The early settlers are now well-to-do, having large farms and spacious buildings. In the settlements at Clayton, Lublin, and Thorp, the farms vary in size from 80 to 1,000 acres. Although the farmers here experiment with many crops, the chief income is derived from dairy products.[28] Later comers have not fared so well. After the World War many Ukrainians left the cities and purchased farms in Ohio, Indiana, and, a few, in Illinois. The Bolegay, a Ukrainian real-estate agency in Chicago, placed scores of families on land in Indiana and nearby States. The depression beginning in the late twenties drove many of them from the cities.

The Ukrainian farm element in North Dakota has an interesting history. The members of the first group to arrive there came by way of Canada in 1896 and 1897. They had intended to settle in the Dominion, but, disliking their immediate prospects, they were persuaded by Dakota agents to try the plains. In some cases their transportation was paid. These first settlers were from East Galicia, and they settled on land that later became known as the towns of Belfield and Wilton.[29]

A group of the Protestant refugees already referred to met a co-religionist, a Ukrainian-German named Peter Zeller, on shipboard, who dissuaded them from going to Virginia as they had planned and took them with him to Trip, South Dakota.[30] At

[28] Wasyl Halich, "Ukrainians in Wisconsin," in *Svoboda* (Jersey City), June 28, 1932.

[29] At that time the land was not yet surveyed, although there was a land office at Dickinson, twenty miles east. Wasyl Halich, "The Ukrainian Farmers in North Dakota," in *Narodne Slovo* (Pittsburgh), Dec. 14, 1933, and "Through the Ukrainian Villages in North Dakota," in *Svoboda* (Jersey City), Aug. 28, 1933.

[30] The author is indebted for knowledge of this incident to an eyewitness, George Michalenko, who still lives at Kief.

Numerous German agricultural communities existed in the Ukraine, some of them dating from the reign of Peter the Great. By 1880 many from these communities emigrated to the Dakotas, and through them the Ukrainian Protestants learned of homesteads. In Dakota these Germans are commonly called Russians,

the close of the winter, many took trains for Harvey, North Dakota. Ten families, however, bought horses, wagons, seeds, and other necessaries to start farming in a new country, and trekked there in covered wagons, reaching their destination after plowing through mud for two weeks. They filed homestead claims in McHenry and McLean counties, and several of these pioneers, still living in Kief and its vicinity, frequently tell of the hardships of their trip and the first years in North Dakota.[31] They wrote to friends and relatives in Pennsylvania, Virginia, and the Ukraine, and as a result hundreds soon joined them, the largest number coming directly from the province of Kiev in the Ukraine. Within fifteen years the Ukrainian element rose to about eight thousand.

The climate and soil of this region resemble those of the Ukraine, and because the land was free and there was freedom of religion, North Dakota became the haven of the Ukrainian Protestants. They settled on a strip of land about 40 miles in length and about 15 miles in width, through which the Soo Railroad was built in 1908.[32] The population is solidly Ukrainian with only rarely a Norwegian or a German farmer. In the central-western part of the State, Ukrainian immigrants occupy about half of Billings and Dunn counties. Much smaller groups live in Williams, Barnes, Trail, and Pembina counties. In 1933, they numbered close to ten thousand. South Dakota likewise has a large Ukrainian population, but they settled among farmers of other nationalities and did not form compact groups.

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and so also, in most communities, are the Ukrainians. While visiting nearly all of the Ukrainian settlements in North Dakota, the author learned of only one real Russian farmer, and he lived north of Max. Nevertheless, one Russian author, Marko Uchimovich Vilchur, in his *Russkie w Amerike*, 40–45 (New York, 1918), gave considerable space to the "Russians" of that State. Although the Germans of North Dakota emigrated from the Ukraine, they are considered as Germans in this article. Similarly the word "Russian" is used to designate a person of Russian blood, speech, and nationality, formerly called Moscovite, and more recently Great Russian, and not a person of any nationality born within the old Russian empire.

[31] In 1933, five of the original group were living at Kief.

[32] Letter from Edward Simbalenko to the author, Jan. 27, 1932.

Coming from the steppes of the Ukraine, these immigrants were well fitted for life on the plains of North Dakota, and it did not take them long to become accustomed to the climate and conditions there. Their first few years, as with all pioneers, were filled with hardship. When the land was hilly, the enormous deposits of drift stones had to be removed. In some regions there was trouble with the ranchers. However, endurance, hard labor, and thrift brought a measure of prosperity and progress. Sod houses were replaced by wooden structures, horses by tractors, and buggies and wagons by automobiles and trucks. Instead of their original 160-acre tracts, most Ukrainian farmers now have 320, 480, and even 640 acres. Several own three and four sections each.[33] While subduing the wilderness these Protestants did not neglect the education of their children; neither did they limit it to the three "R's," and consequently, they produced people prepared to hold higher positions in life.[34]

A few of the Ukrainian farmers in North Dakota and other States have sought to better themselves by turning to business in nearby villages. The most common enterprises that have interested them are grain elevators, grocery and hardware stores, farm implement shops, and in recent years, gasoline stations. A number have been quite successful. Others have become carpenters, shoemakers, or barbers, each according to his taste and ability. In nearly every case, they have proved capable and have made a success of their work. Probably the most successful rural business men are those at Kief, Butte, and Max, North Dakota.

During the World War many of the Dakota Ukrainians moved to Montana. The largest and oldest Ukrainian settlement there is at Scobey. It was started by a group that came by way of Canada about 1897. There are also farming communities at

[33] Letter from Rev. John Senchuk to the author, Apr. 26, 1932.

[34] In 1933, sixty-six sons and daughters of North Dakota Ukrainians were teaching, and nearly as many more had taught school. Wasyl Halich, "Ukrainian Teachers in American Schools," in *Svoboda* (Jersey City), Aug. 15, 1933.

Sand Creek and Larslan, and farther west, near Giltedge, several Ukrainians have ranches.[35]

The Ukrainians hold a definite place among the immigrant farm groups of the United States. There are nearly 3,800 Ukrainian families, or 26,000 individuals, living in eighty-five rural communities, and about one-third as many more on widely scattered farms throughout the country. Nearly all of these communities are sufficiently large to maintain churches, schools, or other forms of social organization. The Ukrainians have sought social as well as economic progress, and its achievement is manifested by schools and some forty-nine rural churches. Most of them have desired to give their children a good education, and as a result, many of the second and third generations are teachers, nurses, physicians, and technicians. As farmers, the Ukrainians are industrious and thrifty, and cooperate with their neighbors of other nationalities, perhaps even better than they do with each other. Appreciating the opportunities that America offered them, they are ready to participate in all good works in the land of their adoption.

WASYL HALICH

Superior, Wisconsin

[35] In 1933, Scobey had thirty-one Ukrainian families, according to H. Kinzersky, a member of the group. A ranchman acquainted with Montana observed that many Ukrainian laborers come and go in Great Meadows, Anaconda, Butte, and Miles City. Letter from Sava P. Charnecky to the author, Sept. 18, 1932.

NEWS NOTES AND COMMENTS

EDITORIAL

With the present number, *Agricultural History* begins the tenth year of its existence. No one realizes more than the Editor the imperfections and shortcomings of the volumes thus far issued, and perhaps only the contributors will join with him in asserting that a diligent effort has been made to improve the format and style as experience dictated. The readers may be assured that the editorial work will become increasingly discriminating, and, it is hoped, more scholarly.

As the Editor sees the problems incident to the publication of *Agricultural History*, the main drawback is the limited income which the Agricultural History Society has to devote to this purpose. It has not been possible to expand the size of the journal so that all meritorious manuscripts submitted could be printed within a reasonable length of time. Accordingly preference has been given to articles that help to define the field of research to which the journal is dedicated and also to those bearing on subjects not hitherto covered by monographs or articles in other historical journals. It has been impossible to establish a regular reviews section, and the Editor, not being able to promise early publication, has hesitated to invite the submission of articles on many subjects which, in his opinion, deserve inclusion. Particularly is this true of the history of the technical phases and processes of agriculture.

In the News Notes and Comments section an effort has been made to cite current articles and books on the history of agriculture, and also materials on institutions, organizations, and sciences that have been factors in agricultural development. Mr. G. E. Fussell of the British Ministry of Agriculture and Fisheries has loyally supplied notes on the British Isles, and it is a matter of regret that lack of space has prevented the systematic inclusion of similar notes for all agricultural countries. The Editor would be interested to know the extent to which the News Notes and Comments section is helpful to the readers of *Agricultural History*.—*Everett E. Edwards.*

DECEMBER MEETING OF THE AGRICULTURAL HISTORY SOCIETY

The Agricultural History Society met currently with the American Historical Association and other historical societies at Chattanooga, Tennessee, on December 27–30, 1935. The joint literary session of the Agricultural History Society on Friday morning, December 27, was devoted to the following papers: Virginia's Western Lands, by Professor Thomas P. Abernethy of the University of Virginia; Frontier Economy in Southwestern Pennsylvania, by Dr. Solon J. Buck of the National Archives, Washington, D. C.; The Establishment of Red Clover in the United States (read by title only), by Miss Mary R. Burr of the U. S. Department of Agriculture; and Grain Drills through Thirty-Nine Centuries, by Dr. Russell H. Anderson of the Museum of Science and Industry, Chicago. Professor Hugh

T. Lefler of the University of North Carolina acted as chairman of the session, and about sixty were in attendance. Following the luncheon sponsored by the Agricultural History Society on the same day, Professor Avery Craven of the University of Chicago presented a brilliant address entitled "A Rural Interpretation of the Causes of the Civil War" before the one hundred and sixty guests assembled for the occasion. Mr. Everett E. Edwards presided.

CURRENT ARTICLES AND BOOKS ON THE HISTORY OF AMERICAN AGRICULTURE

General or unclassified: "Early Grain Inspection History," *Modern Miller*, 62 (51):17 (Dec. 21, 1935), especially the contributions of S. H. Stevens. "Publications of the United States Agricultural Society," *Agr. Libr. Notes*, 10:521–523 (December 1935). B. W. Allin and K. H. Parsons, "Rural-Urban Migration in Relation to Land Quality," *Land Policy Rev.*, 1 (2):9–12 (March 1935). T. S. Berry, "Wholesale Commodity Prices in the Ohio Valley, 1816–1860," *Rev. Econ. Statis.*, 17 (5):79–93 (August 1935). T. J. Cauley, *Agrarianism; A Program for Farmers* (Chapel Hill, Univ. N. C. Press, 1935. 211 p.), reviewed by Karl Brandt in *Survey Graphic*, 24:357–358 (July 1935). A. R. Cordova, "The Taylor Grazing Act," *N. Mex. Business Rev.*, 4: 193–201 (October 1935). Ferris D. Cornell, Jr., "The Development of Agricultural Machinery" (Morgantown, W. Va., 1931) 256 p., typewritten). P. W. Gates, "American Land Policy and the Taylor Grazing Act," *Land Policy Circ.*, October 1935, p. 15–37. Richard Hartshorne, "A New Map of the Dairy Areas of the United States," *Econ. Geogr.*, 11:347–355 (October 1935). W. B. Hesseltine, "Economic Factors in the Abandonment of Reconstruction," *Miss. Valley Hist. Rev.*, 22:191–210 (September 1935). R. M. Hower, "Wanted: Material on the History of Marketing," Business Hist. Soc. *Bull.*, 9:79–81 (October 1935). W. T. Hutchinson, "The Reaper Industry and Midwestern Agriculture, 1855–75," in Avery Craven, ed., *Essays in Honor of William E. Dodd*, 115–130 (Chicago, Univ. Chicago Press, 1935). J. T. Jardine, "The Development of Rural Sociological Research," *Rural Amer.*, 13 (8):8–11 (November 1935). B. Y. Landis, *A Guide to the Literature of Rural Life* (New York, Dept. Research and Educ., Federal Council of the Churches of Christ in America, 1935. 15 p.). T. P. Martin, "Cotton and Wheat in Anglo-American Trade and Politics, 1846–1852," *Jour. South. Hist.*, 1:293–319 (August 1935). D. S. Muzzey and P. D. Miller, "The Decline of American Agriculture [1900–1920]," *Amer. Observer*, 4 (31):8 (Apr. 15, 1935). W. C. Neely, *The Agricultural Fair* (New York, Columbia Univ. Press, 1935. 313 p., illus.), reviewed by E. E. Edwards in *Minn. Hist.*, 16:327–328 (September 1935), and by J. F. McDermott in *Miss. Valley Hist. Rev.*, 22:314–315 (September 1935). C. P. Nettels, *The Money Supply of the American Colonies before 1720* (Madison, Univ. Wis., 1934. 300 p.), reviewed by C. H. Karraker in *Amer. Hist. Rev.*, 41:386 (January 1936). J. K. Rose, "Corn Yield and Climate in the Corn Belt," *Geogr. Rev.*, 26:88–102 (January 1936). Phil Stong, "Fair for the Farmer," *Today*, 4 (14):14–15 (July 27, 1935). L. S. Sutherland, "The Use of Business Records in the Study of History," Inst. Hist. Research *Bull.*, 13:69–72 (November 1935). Henry Tatter, "State and Federal Land Policy during the Confederation Period," *Agr. Hist.*, 9:176–186 (October 1935). G. F. Warren and F. A. Pearson, *Wholesale Prices for 213 Years, 1720 to 1932* (Ithaca, Cornell Univ. Agr. Expt. Sta., 1932. 222 p.).

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